

§ 84.11

vertical filament and a very narrow division between the green and red sections, external screens need not be fitted.

(b) On power-driven vessels less than 12 meters in length constructed after July 31, 1983, the masthead light, or the all-round light described in Rule 23(c) shall be screened to prevent direct illumination of the vessel forward of the operator's position.

§ 84.11 Shapes.

(a) Shapes shall be black and of the following sizes:

(1) A ball shall have a diameter of not less than 0.6 meter;

(2) A cone shall have a base diameter of not less than 0.6 meter and a height equal to its diameter;

(3) A diamond shape shall consist of two cones (as defined in paragraph (a)(2) of this section) having a common base.

(b) The vertical distance between shapes shall be at least 1.5 meter.

(c) In a vessel of less than 20 meters in length shapes of lesser dimensions but commensurate with the size of the vessel may be used and the distance apart may be correspondingly reduced.

§ 84.13 Color specification of lights.

(a) The chromaticity of all navigation lights shall conform to the following standards, which lie within the boundaries of the area of the diagram specified for each color by the International Commission on Illumination (CIE), in the "Colors of Light Signals", which is incorporated by reference. It is Publication CIE No. 2.2. (TC-1.6), 1975, and is available from the Illumination Engineering Society, 345 East 47th Street, New York, NY 10017 and is available for inspection at the Coast Guard, Ocean Engineering Division (CG-432), (CG-432), 2100 2nd St., SW., Stop 7901, Washington, DC 20593-7901. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html. This incorporation by reference was approved by the Director of the Federal Register.

33 CFR Ch. I (7-1-11 Edition)

(b) The boundaries of the area for each color are given by indicating the corner co-ordinates, which are as follows:

(1) *White*:

x 0.525 0.525 0.452 0.310 0.310 0.443
y 0.382 0.440 0.440 0.348 0.283 0.382

(2) *Green*:

x 0.028 0.009 0.300 0.203
y 0.385 0.723 0.511 0.356

(3) *Red*:

x 0.680 0.660 0.735 0.721
y 0.320 0.320 0.265 0.259

(4) *Yellow*:

x 0.612 0.618 0.575 0.575
y 0.382 0.382 0.425 0.406

[CGD81-008, 46 FR 62447, Dec. 24, 1981, as amended at 69 FR 18803, Apr. 9, 2004; USCG-2004-18057, 69 FR 34925, June 23, 2004; USCG-2008-0179, 73 FR 35002, June 19, 2008; USCG-2010-0351, 75 FR 36281, June 25, 2010]

§ 84.15 Intensity of lights.

(a) The minimum luminous intensity of lights shall be calculated by using the formula:

$$I = 3.43 \times 10^6 \times T \times D^2 \times K^{-D}$$

where I is luminous intensity in candelas under service conditions,
T is threshold factor 2×10^{-7} lux,
D is range of visibility (luminous range) of the light in nautical miles,
K is atmospheric transmissivity. For prescribed lights the value of K shall be 0.8, corresponding to a meteorological visibility of approximately 13 nautical miles.

(b) A selection of figures derived from the formula is given in Table 84.15(b):

TABLE 84.15(B)

Range of visibility (luminous range) of light in nautical miles D	Minimum luminous intensity of light in candelas for K=0.8 I
1	0.9
2	4.3
3	12
4	27
5	52
6	94

§ 84.17 Horizontal sectors.

(a)(1) In the forward direction, sidelights as fitted on the vessel shall show the minimum required intensities. The intensities shall decrease to